

What is Claimed Is:

1. Method for the production of a film tube on a cellulose basis, which is strengthened by an insert, by extruding an aqueous cellulose-N-methyl-morpholine N-oxide (NMMO) solution onto the insert, which is drawn from a roll and formed into a tube with overlapping longitudinal seam, characterized in that the tube passes through a heating section situated ahead of the nozzle block and communicating therewith, in which the insert is preheated with hot air to the temperature of the extruded cellulose-NMMO solution, and then the seam is cemented with pure NMMO or cellulose-NMMO solution, and the tube is then carried through the nozzle block in which the cellulose-NMMO solution is applied to the tube and penetrates it, in order to obtain an insert-reinforced film tube, that the interior of the film tube is filled with an aqueous NMMO solution, and that the film tube exits from the nozzle block and enters into a spin bath, is turned about in the latter and is carried out.
2. Method according to claim 1, characterized in that emulsifiers, wetting agents and/or anchoring agents are applied by one of the known methods such as roller application.
3. Method according to claim 1, characterized in that pressure-regulated supporting air is blown into the interior of the film tube after departure from the nozzle block.
4. Method according to claim 1, characterized in that the film tube is carried through a heated annular gauging disk through which a heating medium flows in a controlled circuit.
5. Method according to claim 1, characterized in that the aqueous NMMO solution is delivered through the nozzle block into the interior of the film tube and also removed from it, the delivery and removal being performed at a distance apart from one another.
6. Method according to claim 5, characterized in that the level of the delivery of the aqueous NMMO solution is adjustable and that the removal is performed such that the level in the film tube is variably higher by up to 20 mm and lower by up to 45 mm than the level in the spin bath.

09787416-061501
TOST90-9TH/28/60

7. Method according to claim 1, characterized in that the film tube, after leaving the nozzle block, runs through an air section until it enters into the spin bath, and that in the air section an external temperature treatment takes place which regulates the rate of solidification of the cellulose-NMMO solution of the film tube.

8. Method according to claim 1, characterized in that the film tube plunges vertically into the spin bath and with maintenance of a constant tension is turned about by a powered return roll running close to the bottom of the spin bath tube and is carried out upwardly at an angle from the spin bath.

9. Method according to claim 1, characterized in that the spin bath level inside and outside of the film tube is lowered as far as the upper edge of a return roll and that the film tube is sprayed inside and out with spin bath.

10. Method according to claim 1, characterized in that the longitudinal seam of the tubular envelope is cemented with straight NMMO or a cellulose-NMMO solution at a temperature of 15 to 110°C, especially at the temperature of the cellulose-NMMO solution extruded in the nozzle block.

11. Method according to claim 1, characterized in that the cellulose content of the extruded cellulose-NMMO solution amounts to 1 to 15 wt.%, especially 3 to 7 wt.-% with respect to the total solution, and that the average degree of polymerization ranges from 250 to 800, especially from 300 to 500.

12. Method according to claim 1, characterized in that the aqueous NMMO solution of the spin bath has an NMMO concentration of 5 - 50 wt.-%, especially of 8 to 20 wt.-% and that the spin bath is adjusted to 0 to 50°C, especially 2 to 20°C.

13. Apparatus for producing a film tube on a cellulose basis, which an insert reinforces, by extruding an aqueous cellulose-N-methylmorpholin-N-oxide (NMMO) solution onto the insert, with a nozzle block (7) and a spin bath (11), characterized in that a supply roll (2) for the insert (3), a deflector roll (4), and a forming section (5) in which the insert (3) is formed into a tube (6) with overlapping longitudinal seam, are present, that a preheating system (15) for the tube (6) is disposed ahead of the nozzle block (7), that the preheating system (15) is connected by hot air ducts (22, 23) and an exhaust duct (24) to a controllable heater (17) from which air heated in the circuit flows into the preheating system (15) and from which cooled air flows back into the heater (17), and that the tube (6) passes through the nozzle block (7) which is preceded by a cementing system (25) for cementing the longitudinal seam and which contains an annular nozzle (21) from whose nozzle gap the cellulose-NMMO solution is applied to the tube (6) preheated to the temperature of the extrusion solution for the formation of the film tube (10).

14. Apparatus for the production of a film tube according to claim 13, characterized in that the insert (3) is selected from the group, paper, nonwoven, fiber fleece, fiber paper, the fibers being especially long hemp fibers.

15. Apparatus for the production of a film tube according to claim 13, characterized in that, after the drawing of the insert (3) from the supply roll (2) an applicator system (39) is provided by which additives, such as emulsifiers, wetting agents and/or anchoring means can be applied

to the insert and dried in the following hot open air section.

16. Apparatus for the production of a film tube according to claim 13, characterized in that the nozzle block (7) contains a ring nozzle (21) which is heated by a heating medium, and that the delivery tube, the removal tube (18, 19) and the duct (20) for the air supporting the film tube (10) are brought centrally through a gauging ring disk (8) which is arranged concentrically with the ring nozzle (21) in the film tube interior and forms with the latter an annular gap (26) through which the film tube (10) runs.

17. Apparatus for the production of a film tube according to claim 16, characterized in that the gauging ring disk (8) is connected to the heating circuit (16) for the purpose of heating.

18. Apparatus for the production of a film tube according to claim 16, characterized in that the delivery tube (18) and the removal tube (19) are individually height-adjustable within the film tube (10).

19. Apparatus for the production of a film tube according to claim 18, characterized in that the delivery tube (18) is disposed in an upper position at the beginning of the delivery of the aqueous NMMO solution into the film tube (10) and at the start of continuous operation assumes a position above the return roll (13).

20. Apparatus for the production of a film tube according to claim 16, characterized in that the heating medium flows through the ring nozzle and is carried in a controlled heating circuit (16).

21. Apparatus for the production of a film tube according to claim 13, characterized in that the air section (9) amounts to 1 to 1000 mm, especially 200 to 500 mm, and that if necessary the film tube (10) can be heated to delay its solidification or cooled to accelerate its solidification in the air section.

22. Apparatus for the production of a film tube according to claim 13, characterized in that the

05797416 : 061504
TOST90 : 9T426250

return roll (13) disposed near the bottom of the spin tub (12) is driven and exerts a constant tension on the vertically descending film tube (10).

23. Apparatus for the production of a film tube according to claim 22, characterized in that the film tube (10) lies flat against the return roll (13) along a line of contact (27) as a result of the tension exerted on the film tube (10).

24. Apparatus for the production of a film tube according to claim 13, characterized in that the spin bath (11) and the aqueous NMMO solution in the film tube (10) have equal NMMO concentrations at the beginning of the extrusion of the film tube (10).

25. Apparatus for the production of a film tube according to claim 13, characterized in that the excess pressure of the supporting air in the film tube (10) amounts to 0.1 to 10 mbar in the range of the air section (9).

105130-9142860